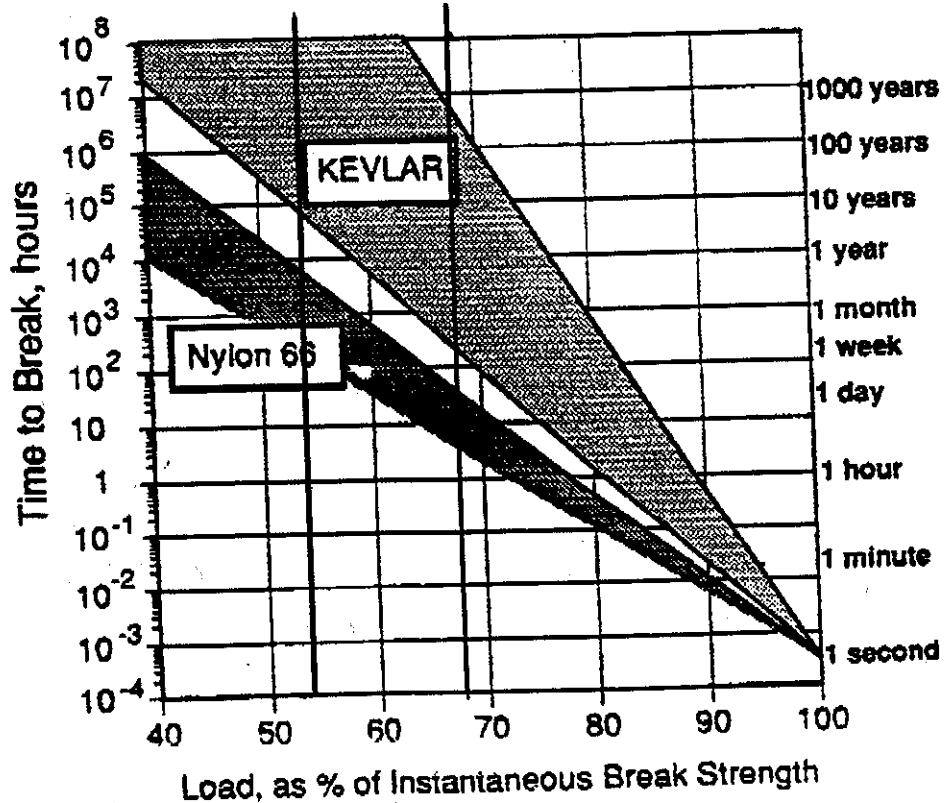


4.3 STRESS RUPTURE

Stress rupture is the sudden failure (break) in a material held for long periods of time under loads which are less (sometimes considerably less) than the nominal tensile strength of the material. For practical purposes, stress rupture is measured under a constant load, so-called "dead weight". The greater this load, the more quickly failure occurs. Inversely, even the smallest load could theoretically cause stress rupture if enough time were allowed. Although considerable variability is evident in stress rupture lifetime, KEVLAR is superior to nylon (Figure 4.8) and will support a large fraction of its nominal break load for a long time: for KEVLAR yarns, with dead loads below 40 % of the ultimate tensile strength, failure by stress rupture would occur only after more than a century. The stress rupture properties of wet and dry yarns were the same.

Figure 4.8

STRESS RUPTURE OF YARNS AT ROOM TEMPERATURE



* Du Pont registered trademark